Roll No. | | | | | | | | | | |

B.E DEGREE(FT) END SEMESTER EXAMINATIONS April / May 2019

Computer Science Engineering & Information Technology

Semester II

PH8253 & Physics for Information science

(Regulation 2012)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What are the merits of classical free electron theory?
2. Define Fermi level and Fermi energy.
3. What are direct and indirect band gap semiconductors?
4. Give any two differences of Schottky diode and ohmic contact.
5. What is Bohr magneton?
6. What are soft and hard magnetic materials? Give examples
7. The wavelength of the light emitted from semiconductor laser is 1.55 μm. Find its band gap in eV.
8. What are the advantages of organic LED?
9. What do you understand by quantum confinement?
10. What is spintronics?

Part – B (5 x 16 = 80 marks)
(Question No.11 is Compulsory)

11. Derive the expressions for electrical and thermal conductivity on the basis of free electron theory and hence prove Wiedemann Franz law.

12. a) i) Derive an expression for the density of electrons and holes in intrinsic semiconductor. (12)
ii) Find the resistance of an intrinsic Ge rod 1cm long, 1mm wide and 1mm thick at 300K. For Ge , $n_i = 2.5 \times 10^{19}/m^3$, $\mu_e = 0.39 m^2/Vs$ and $\mu_h = 0.19 m^2/Vs$ at 300K. (4)

(OR)

b) i) What is Hall effect? Derive an expression for Hall coefficient in an n-type semiconductor. (12)
ii) A copper strip 2.0 cm wide 1.0 mm thick is placed in a magnetic field of flux density 1.5 Wb/m^2 perpendicular to the strip. Suppose a current of 200A is set up in the strip. What Hall potential difference would appear across the strip? (4)

13. a) Classify the magnetic materials based on their magnetic moments and compare their various properties.

(OR)

b) Write an essay on how data are stored in magnetic tape, floppy disk and hard disk. Mention their merits and demerits.

14 a) Explain the working of twisted nematic liquid crystal display with neat diagram and mention their applications.

(OR)

b) Explain in detail data storage techniques in DVD and holography.

15 a) What is meant by tunneling phenomena? With neat sketch explain the working of Resonant Tunneling Diode.

(OR)

b) What is meant by single electron phenomena? With neat sketch explain the construction and working of single electron transistor.